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ABSTRACT

The data gathered from the Pennsylvania Educational Quality Assessment (EQA) inventory from 1978 to 1981 were analyzed. The results of the analysis were used to determine whether nationwide trends in levels of achievement, opinions, and attitudes of public school students are reflected in Pennsylvania. The status of currently emphasized skills and attitudes in Pennsylvania schools was also assessed. The percentage of Pennsylvania students who selected the correct response to multiple-choice items measuring reading comprehension, mathematics, and writing skills has generally increased over the period studied. Attitudes toward their schools, teachers, schoolwork, and communities have remained relatively stable. The report cites specific research results in the areas of basic skills, political system, safety, drugs and alcohol abuse prevention, occupational opportunities, energy and environment, and arts and the humanities. The data assessed in this report are from a relatively small number of the more than 500 items on the EQA questionnaire. (DWH)

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PENNSYLVANIA'S PUBLIC SCHOOL STUDENTS: WHAT DO THEY KNOW? WHAT DO THEY THINK?

Leann R. Miller

Introduction

Since 1970 the Educational Quality Assessment (EQA) program in Pennsylvania's Department of Education has been measuring in some manner the levels of achievement and the opinions and attitudes of the Commonwealth's public school students. Data gathered from the latest form of the EQA inventory (first used in March of 1978) are now being analyzed to determine (1) if some nationwide trends are reflected in Pennsylvania and (2) what the status is in our schools of some currently emphasized skills and attitudes. Some tentative findings based on those analyses are reported here.

Before presenting any information, however, it is necessary to caution against making specific statements when using the data in this report, since it is presented in a somewhat general, informal manner. Anyone desiring a more detailed interpretation of any of the information should contact the EQA staff.

The data in this report are based on results from assessing representative samples of fifth, eighth and eleventh graders in Pennsylvania's public schools from 1978 to 1981 (from 1974 to 1981 for one set of fifth grade data). In any year, between 6,800 and 12,000 students responded to each of the items analyzed.

Administrators in schools are given a report which compares their school results with the statewide sample in several ways in an effort to supply them with data to analyze program strengths and weaknesses. In this way, Pennsylvania schools are able to conduct continuing assessments of curriculum and the school environment.

The Results in General

For the most part, results are encouraging. Pennsylvania's students appear to be winning a battle in the nationwide war against declining test scores: the percentages of students choosing the correct response to multiple choice items measuring reading comprehension, mathematics and writing skills generally increased or at least remained the same over the last four years. For example, the percentage of fifth graders responding correctly decreased for only eight of 153 "basic skills" items. These decreases averaged only a little more than one percent. The percentages for nine items showed no change. Responses on many of the 136 remaining items showed increases in correct choices of from five to eight percent -- significant positive differences in samples with such large numbers of cases.

The attitudes of eighth and eleventh grade students toward their schools, teachers, schoolwork and communities have changed little over the same four-year period. However, findings from an eight-year study of fifth graders' attitudes toward school show marked improvement in some areas, such as interest in writing and mathematics and in simply being in school. The remainder of this report presents specific results in these and other areas.

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Some Specific Results

WHAT ABOUT THE BASICS?

Pennsylvania's elementary students can do the basic processes of mathematics. Between 85% and 95% of fifth graders consistently chose the correct response to addition, subtraction and multiplication computation problems over the last four years, and percentages increased significantly for division problems. In contrast to a national trend of declining problem-solving skills measured by the National Assessment of Educational Progress (NAEP), fifth graders increased their correct responses to mathematics problem-solving items by as much as 5 percent. Some results:

	Percentage of 5th graders choosing correct response	
	1978	1981
Addition: computation Example: 634 26 +285	90	91
Multiplication: computation Example: 40 X 8 =	93	95
Division: computation Example: 156 ÷ 3 =	82	87
Subtraction: problem-solving Example: If students have been in school for 86 of 180 days scheduled, how many more days do they have to go to school?	74	79

Junior high students did almost as well as fifth graders in maintaining percentages of correct responses to computation items. Again, percentages for division problems rose significantly and those for problem-solving items generally increased by 1 to 4 percent. Three examples:

	Percentage of 8th graders choosing correct response	
	1978	1981
Multiplication: computation Example: 659 X 44	81	82
Division: computation Example: 67025 ÷ 33 =	66	72

	Percentage of 8th graders (Continued) choosing correct response	
	1978	1981
Multiplication: problem-solving Example: If Mr. Mason covered 410 square feet with one gallon of paint, how many square feet could he cover with five gallons?	73	74

By the time students are in high school, the public is concerned that they are learning skills like balancing a checkbook or figuring sales tax. Pennsylvania's eleventh graders appear to be adept at the former and to be holding their own with other problem-solving skills. Some problem-solving item results:

	Percentage of 11th graders choosing correct response	
	1978	1981
Figuring a checkbook balance given the beginning balance and the amounts of three checks	87	88
Figuring miles per gallon: item 1	74	74
item 2	67	68
Figuring sale price given original price and percent of discount	55	56

Several of these statistics indicate that Pennsylvania's public school student performance contrasts with a national downward trend in problem-solving skills detected by NAEP in 1978. NAEP tests 9-, 13- and 17-year-olds, and significant declines of six, three and five percent in problem-solving skills at those respective age levels were recorded at that time.

For reading and writing skills too, with one exception, the Commonwealth's students at all levels have maintained or slightly improved their scores on the EQA measures. A look at statewide average (mean) scores supports this finding:

	Mean Scores	
	1978	1981
Grade 5 - Reading	27.3	28.6[a]
Writing Skills	28.8	29.8[b]
Grade 8 - Reading	27.0	27.6[a]
Writing Skills	36.5	37.4[c]
Grade 11 - Reading	25.4	25.3[a]
Writing Skills	34.7	34.9[c]

[a]Average number of items correct out of 48 items
[b]Average number of items correct out of 45 items
[c]Average number of items correct out of 60 items

The reading results parallel national results measured by NAEP in 1980: gains in reading skills scores were recorded for 9- and 13-year-olds, but a slight decline was recorded for 17-year-olds (the group most comparable to eleventh graders).

THE POLITICAL PROCESS

The political system and its processes have been the targets of criticism since long before Watergate. In light of our recent political struggles and the 1980 Presidential campaign, what do students know about some basic political concepts? Are they interested in learning more about the political process?

Knowledge of law and government is measured at all three grade levels. Most fifth graders (81%) know that the capital of Pennsylvania is Harrisburg, and only a slightly smaller percentage (77%) chose Washington, D.C. as the capital of the United States. However, only one percent more of the eighth graders are sure about the nation's capital. When asked at what age someone can vote for the President of the United States, 79% of eighth graders and 85% of eleventh graders chose the correct age of 18. Since these figures increased by five percent and one percent respectively over the past four years, it appears that recent political events may have had some impact on political education at least at the junior high level.

Have the efforts to pass the ERA made an impression? It appears not, in general, since only about a quarter of eighth graders and fewer than half of eleventh graders know that the Constitution can be changed only by amendment:

		Percentage choosing correct response	
		1978	1981
"Changes can be made in the U.S. Constitution by (a) Congress; (b) majority vote of all citizens; (c) state governors; (d) amendment."	Grade 8	26	24
	Grade 11	41	42

At eighth grade, about two-thirds of the students (64%) know that the main job of Congress is to make laws rather than to make sure laws are obeyed or to decide when someone has broken a law. But are secondary students interested in seeing the political process in action at a very accessible point -- the

campaign office? The idea doesn't appear to interest them very much, because when asked whether they would like to spend some time at a campaign office to find out more about how people are elected, fewer than a quarter of both eighth and eleventh graders responded positively. They are somewhat more positive, however, in expressing a desire to learn more about how laws are made:

Would you want to:		Percentage choosing each response - 1981 Definitely Would	Probably Would
Spend some time at a campaign office to find out more about how people are elected?	Grade 8	7	15
	Grade 11	6	17
Learn more about how laws are made by our government?	Grade 8	14	26
	Grade 11	11	27

Will secondary students obey the law and law enforcement officials? When confronted with a situation in which they are asked if they would obey a police officer's order to move away from a fire, most eighth graders (86%) and most eleventh graders (89%) indicated they would, especially if it would ease the work of the firefighters at the scene.

THE WORLD OF WORK

Are Pennsylvania's students being prepared for the occupational opportunities available in today's job market and those that will be available in the future? While EQA does not measure job skills as such, it does measure students' knowledge about job functions, salary and pay, education and training requirements and working conditions. Even at fifth grade, over three quarters of the students (80%) know that steel mill workers have to spend much of their time in a hot place, and almost as many (68%) know that an accountant would help with filling out an income tax form. Only 41 percent, however, realize that a computer operator may not need a college degree. A majority (54%) understand that once you have been trained to do a certain job, you may have to be retrained later to do another job.

Eleventh graders are most aware of occupations which require a college degree and of those that have the highest starting salaries. They do not appear to realize, however, that service jobs will probably provide the greatest employment opportunities in the future -- in 1981 only 28 percent chose that response, and that is up 3 percent from 1978.

When asked if they would like to learn more about various occupations and job markets, high school juniors were at times less than enthusiastic. They appear to be much more interested in scientific research than in the stock market (51% positive responses as opposed to 27%). Over half say they would be interested in visiting factories and businesses, and listening to police

officers or lawyers seems to have more appeal than learning about government at various levels:

	Percentage of 11th graders choosing each response - 1981	
	Definitely Would	Probably Would
Would you want to:		
Visit a research laboratory to see scientists at work?	20	31
Listen to a stockbroker tell how the stock market works?	7	20
Learn about business and industry by visiting factories and businesses?	15	38
Listen to police officers or lawyers give a talk about their work?	12	31
Spend a day with a mayor to see what he/she does?	13	26
Learn more about governmental agencies such as the FBI or the Department of Agriculture?	10	25

SAFETY, DRUGS AND ALCOHOL

Drug and alcohol abuse prevention programs and publicity have become part of American life. Do our students know about the effects of controlled substances, and what are their attitudes toward their use? Have knowledge and attitudes changed over the past four years? Knowledge data are collected only at fifth grade, and it appears that those students are more aware now of the adverse effects of drugs and alcohol than they were in 1978: a majority (56%) knows that drugs and alcohol may be habit-forming, and almost all fifth graders (93%) know that smoking can increase chances of heart and lung disease. Growth over the four-year period can be seen:

	Percentage of 5th graders choosing correct response	
	1978	1981
Concept:		
The habit forming effects of drugs (sleeping pills) and alcohol	51	56
Heart and lung disease as possible effects of smoking	91	93

Eighth and eleventh graders' attitudes toward smoking and drinking are measured in a situational context -- would they drink beer at a party or take a cigarette if it was offered to them? Responses on several of these items have been changing in a positive direction. At both grade levels fewer students are saying they would try marajuana at a party or take the proffered cigarette:

		Average Percentage choosing "Definitely Would" or "Probably Would" Responses	
		1978	1981
Try a marajuana cigarette at a party	Grade 8	34	29
	Grade 11	49	44
Take the (regular) cigarette offered	Grade 8	29	26
	Grade 11	30	27

Beer drinking at a party apparently is not feared much by secondary students, and this has not changed much over the past four years:

Drink beer at a party	Grade 8	46	47
	Grade 11	70	71

However, if eleventh graders have to drive home from that party, the percentage who say they would drink the beer decreases significantly -- then, only 46 percent say they would imbibe.

ENERGY

Another contemporary topic about which schools should perhaps be concerned is energy/environment. Do Pennsylvania students express any interest in the search for alternative forms of energy for the future? Only a few more than one-third (36%) of high school juniors say they would like to learn more about new uses of atomic energy. But about one-half (49%) say they would like to find out more about what scientists are doing to develop new types of energy, and this is almost matched by 8th graders (42%). Do the possibilities of solar energy have appeal? Half (49%) of eighth graders say they would like to look at a display showing new ways energy from the sun is being used.

Has the environment thrust had its day? Senior high students appear to be saying "Yes," but eighth graders, for the most part, are still interested in learning about environmental concepts. Examine these four-year figures:

		Percentage choosing "Definitely Would" or "Probably Would" Responses	
		1978	1981
Would you want to:			
Learn about ways scientists are helping us clean up our rivers and the air we breathe?	Grade 8	60	57
	Grade 11	58	51
Learn how new scientific findings can be used to help preserve our forests and wildlife?	Grade 8	54	54
	Grade 11	51	49

INTEREST IN SCHOOL AND LEARNING

Schools should be places in which children feel successful, fairly-treated and comfortable with their teachers and peers. Students should want to do good work and should feel that their teachers are concerned that they do. Over the past several years, EQA data have reflected slightly better attitudes at the secondary level, and an 8-year study at the elementary level shows that 1981's fifth graders are much better satisfied with their school experiences than their cohorts were in 1974. For example, eight percent more fifth graders (73% in 1981 and 65% in 1974) said they are happy on days they are in school, and 15 percent more (44% to 29%) even like having to remember so many things in school. Writing and mathematics studies gained in popularity over the years, but reading is still at the top of the list:

	Percentage of 5th graders choosing "Very happy" or "A little happy" responses		% gain
	1974	1981	
How do you feel:			
When you practice your writing in school?	59	70	11
When you write stories in school?	69	76	7
When you learn arithmetic in school?	76	87	11
When you learn to read in school?	85	93	8

Only two items declined in percentage of positive responses, and it is difficult to come to conclusions about possible reasons:

How do you feel:	1974	1981
About asking your teacher for help?	77	71
When you think about how fairly children are treated in your school?	69	64

Eighth and eleventh graders' attitudes toward school and learning have shown only slight increases in positive responses over the past four years. Eighth graders feel their courses are more useful than do juniors, but the two groups responded with almost equal enthusiasm when thinking about how much they are learning in their courses:

		Percentage choosing "Strongly Agree" or "Mostly Agree" responses	
		1978	1981
The courses offered in this school are very useful to me.	Grade 8	76	78
	Grade 11	66	68
I feel I am learning a lot in my courses.	Grade 8	79	79
	Grade 11	75	78

Do high schoolers like to learn? It would appear so, since 91% of eleventh graders responded positively to "learning about new ideas interests me very much." Do they think they're being prepared for what life will have to offer? In this regard, they're not quite so positive:

	Percentage of 11th graders choosing each response - 1981			
	Strongly Agree	Mostly Agree	Mostly Disagree	Strongly Disagree
I think this school has prepared me to make better decisions about life's problems.	11	46	28	15

Perhaps somewhat surprisingly, secondary students generally feel their teachers do a good job of teaching and are concerned that their charges are learning:

	Percentage choosing "Strongly Agree" or "Mostly Agree" Responses - 1981	
	Grade 8	Grade 11
Most of my teachers do a good job of teaching.	84	73
Most of my teachers really seem to care that I am able to learn what they teach.	74	66

PARTS OF THE ARTS

What about the other "basics" of our culture -- the arts and humanities? Are students taking part in artistic endeavors? Do they want to continue to participate and to learn more about the enriching activities available in these areas? In activities generally considered to be parts of the fine and performing arts -- drawing, painting, singing, dancing, acting and playing a musical instrument -- the numbers of students reporting participation decline as grade level advances. Still, three quarters of high school juniors say they have recently done a drawing or a sketch:

During the past 3 years, how many times have you:	Percentage indicating they had done the activity at least once		
	Grade 5	Grade 8	Grade 11
Made a drawing or a sketch...?	93	82	79
Painted a picture...?	77	62	46
Acted in a skit or play...?	84	71	43
Performed a dance...?	50	46	36
Played a musical instrument...?	56	50	36
Sung in front of a group of people...?	71	39	27

Interest in spending additional time on such activities appears to derive from participation, since percentage declines on "interest" item responses

parallel those above. More students, for example, express an interest in drawing, sketching and painting than in playing an instrument or singing:

In the future, how much time would you like to spend:	Percentage choosing "A great deal of time" or "Some time" responses		
	Grade 5	Grade 8	Grade 11
Making a drawing or a sketch...?	79	64	60
Painting a picture...?	63	50	41
Acting in a skit or play...?	66	53	31
Performing a dance...?	43	38	29
Playing a musical instrument...?	50	42	28
Singing in front of a group of people?	49	28	23

It is encouraging to examine the results of some items on writing. About three quarters of all Pennsylvania students say they have written a theme on a personal experience in the recent past, and almost 85% of fifth graders report that they had written an interesting letter to a friend or relative. Writing appears to be an activity that decreases and then increases in frequency as students advance through the grades:

During the last 3 years, how many times have you:	Percentage indicating they had done the activity at least once		
	Grade 5	Grade 8	Grade 11
Written a theme or composition expressing your feelings about a personal experience...?	76	72	78
Written a paper...explaining your own ideas about an important social issue...?	47	46	55

Are students knowledgable about famous artists, artistic works and arts concepts? Do they want to learn more about arts processes? While only about one-third of the fifth graders (33%) know that Picasso is an artist, over one-half (53%) identified the Nutcracker Suite as a music- or dance-related work. Over two-thirds of eighth graders know that Dickens and Poe are writers (68% and 67% respectively) and more than three quarters could identify Treasure Island (77%) and A Tale of Two Cities (80%) as works in literature. While only about one third (34%) of juniors could identify Carmen as a musical work, two thirds know that Longfellow and Steinbeck are literature-related (66% and 69% respectively). Between one-half and two-thirds connected such varied names as Swan Lake (66%), the Moog Synthesizer (56%), Brahms (57%), Leonard Bernstein (51%) and Rogers and Hammerstein (51%) with music.

Eleventh graders' interest in learning more about arts processes seems to depend on the art form. Only a quarter would like to learn about how a poet writes a poem, while over half would like to learn more about what makes a movie great:

Would you want to:	Percentage of 11th graders choosing "Definitely would" and "Probably would" responses
Learn more about what makes a movie great?	56
Learn more about what it takes to become a successful actor or actress?	44
Learn about how the movements and steps of a dance are put together?	43
Find out more about how a play is put on?	36
Find out how a composer writes music?	34
Learn about how a poet writes a poem?	23

Being a listener, observer or spectator seems to appeal more to juniors, with one exception:

Hear world-famous singers sing a number of kinds of music?	61
Go to a concert to hear world-famous musicians play many kinds of music?	60
Watch an artist make an art object or paint a picture?	59
See a world-famous play?	52
See a famous dancer perform?	48
Visit a display of famous art objects, such as sculptures?	45
Own a collection of books written by famous authors?	41
Listen to a long musical piece, such as a symphony or an opera?	17

Conclusion

This report is based on data from a relatively small number of the more than 500 items in the EQA questionnaire. Other analyses are being conducted, and results will be similarly reported from time to time.

LRM
February 1982